



Determinants of Corporate Cash Holdings: Evidence from MNCs in Pakistan

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ABSTRACT

The purpose of this article is to investigate whether firm-specific variables (i.e. size, growth opportunities, profitability, capital expenditures, leverage, dividends, cash flow and working capital) affect the cash holdings of MNCs. Moreover, to investigate whether theories relevant to cash holdings provide any justification to narrate the cash holding behavior of listed MNCs on Pakistan Stock Exchange (PSX) for the period 2006-2016. Results indicate that profitability positively impacts cash holdings. Firm size positively impacts cash holdings in pooled Ordinary Least Squares, while it negatively impacts cash holdings in the fixed effects method; however the relationship is insignificant. Leverage, growth opportunities, dividends, working capital ratio and capital expenditures are significant and negatively related to corporate cash holdings. Finally, cash flows are unrelated to cash holdings. In short, results indicate that firm-specific variables significantly affect the cash holdings of MNCs. Moreover, (+/-) coefficients of different explanatory variables indicate that theories relevant to cash holdings provide some support to explain the cash holding behavior of MNCs in an emerging economy - Pakistan.

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1. Introduction

Cash is the oil that lubricates the economy. According to Keynes (1936) an individual or a firm holds cash for transactional, speculative and precautionary motives. Transactional motives include holding cash for the purchase of raw materials, for payment of salaries and wages, for taxes and dividends, and to use cash for other expenditures arising in the ordinary course of business. Speculative motives include holding cash to take the benefits of unexpected opportunities such as an unexpected decline in the price of raw materials, decline in indirect taxes, and reduction in import duties etc. Finally, precautionary motives include holding cash for unexpected needs such as increase in minimum level of wage rate, increase in tax rates, and increase in materials price due to shortages or increase in import duties etc. The Baumol model (1952) of cash treats cash as an inventory item where inflows and outflows can be predicted with certainty. Moreover, this model suggests that a firm could decide an optimal level of cash by weighing

the advantages of reduction in opportunity cost with conversion cost. For instance, by investing cash into marketable securities a firm bears conversion cost but it can save some opportunity cost. In contrast, when future cash flows are uncertain then a model for the demand of money proposed by Miller and Orr (1966) suggests that the cost-efficient cash balances can be determined by identifying an upper control limit (i.e. maximum balance) and a return point (i.e. target balance). Several empirical studies have explored the factors that affect the corporate cash holdings however their results are mixed. Moreover, a number of empirical studies have rather used the data from non-financial companies to examine the cash holding behavior of a specific economic group like MNCs. As for authors' knowledge, no research yet have studied the cash holding behavior of listed multinational companies in Pakistan. Thus, inconsistent empirical results and a little research on multinational companies in Pakistan are few important reasons that have necessitated the need for this study. We are sure that results of this study will be of great use for corporate managers in determining a balance cash level by keeping in mind the impacts of firm-specific constructs on corporate cash holdings.

Remaining paper is structured as follows. Section 2 presents detailed literature review on the determinants of cash holdings. Section 3 provides data description and research methodology. Section 4 provides findings and results. Section 5 presents discussion on the findings. Lastly, section 6 presents the conclusions of the study.

2. Literature review

This section presents the results of previous studies regarding relationship between firm-specific variables and corporate cash holdings. The literature review reveals a number of motives to hold cash in corporations. For instance, by holding cash, corporations can avoid liquidating their assets unnecessarily (Ahrends, Drobetz, & Nomikos, 2017). Similarly, scholars have argued that factors like precautionary motives, brokerage costs, asymmetric information, and cash flow volatility in industry are important factors behind cash holdings (Ahrends et al., 2017; Miller & Orr, 1966; Myers & Majluf, 1984; Opler, Pinkowitz, Stulz, & Williamson, 1999). They suggest that brokerage costs lead corporations to have more liquid resources. Similarly, in case of asymmetric information, borrowing funds from the market proves more costly compared to internally available funds which could actually be ideal for meeting investment requirements. Additionally, they argue that if in firm's industry, average volatility of cash flows is higher, it would lead firm to hold more cash. Ahrends et al. (2017) studied cash holdings of shipping companies belonging to various countries and found that those companies had higher cash holdings compared to similar companies in rest of heavy industries and that greater cash holdings were in fact attributable to higher marginal value to cash.

Roy (2018) examined role of corporate governance in determining cash holdings among India based organizations. Specifically, impact of audit related attributes, the role of board of directors, and ownership structure was assessed for 58 listed companies in India and the findings indicated that companies having stronger corporate governance were having lower cash holdings, whereas their counterparts had higher cash holdings. Roy (2018) also noted that companies also hold more cash to avoid uncertainty, to save them from raising higher funds from market, for making use of market opportunities as they come and for maintaining financial flexibility. In another study, Hsu (2018) analyzed the relationship between corporate social responsibility (CSR) practices and cash holdings for firms based in United States for the period 2005-2015. He found that firms with higher levels of CSR had significantly lower levels of cash holdings; and over the life-cycle, cash holdings portrayed a hump shape.

Certain scholars have attempted to relate expenditures in research and development, and intangible assets (like organizational capabilities and knowledge capital) to corporate cash holdings. They argue that firms that spend greater on research and development tend to hold more cash; and firms with higher level of intangibles are also inclined to greater corporate cash holdings (Falato, Kadyrzhanova, & Sim, 2014; Lei, Qiu, & Wan, 2018; Lyandres & Palazzo, 2016). Study of Lei et al. (2018) covering rich sample of forty five developed and developing countries indicates that investments and cash holdings are influenced by

asset composition and its interaction with the financial development.

Opler et al. (1999) used the data of US firms during 1971-1994 to identify the variables that impact the cash holdings. They found that firms with volatile cash flows and strong growth opportunities hold relatively more cash. In contrast, firms that can easily approach to financial markets prefer to hold low cash. In sum, they reported their findings congruent with the prophecy of trade-off model of cash. Ozkan and Ozkan (2004) have analyzed the data of 1,029 UK firms during 1984-1999 to explore the factors affecting the cash holdings. They found a significant non-monotonic impact of managerial ownership on cash holdings. Moreover, results indicate that leverage, cash flows, growth opportunities, and liquid assets are some important variables that affect the cash holdings. Ferreira and Vilela (2004) used the data of companies in EMU countries to identify the factors that affect the cash holdings. They observed that investment opportunities and cash flows were directly; while liquidity, size and leverage were inversely linked to cash holdings. Moreover, they observed that strong investor protection and concentrated ownership are inversely linked to cash holdings. Furthermore, results indicate that capital market development is negatively linked to cash holdings.

Drobetz and Grüniger (2007) analyzed the data of non-financial Swiss firms during 1995-2004 for exploring the factors that affect the cash holdings. They found that firm size and tangibility are inversely while operating cash flows and dividends are directly linked to cash holdings. Moreover, they observed a non-linear relationship between leverage and liquidity. Furthermore, they observed that growth opportunities are unrelated to cash holdings. Harford, Mansi, and Maxwell (2008) observed that firms with weaker governance structures prefer to repurchase stocks rather than to increase dividends in order to avoid future payout commitments. Kim, Kim, and Woods (2011) analyzed the data of 125 restaurant firms in United States during 1997-2008 for investigating the variables affecting cash holdings. They observed a positive association between investment opportunities and cash holdings. In contrast, size, liquid assets except cash, capital expenditures and dividends are inversely linked to cash holdings. In sum, it is revealed that their findings are in agreement with the predictions of trade-off model of cash. Ramezani (2011) analyzed the data of US companies during 1990-2000 to explore the effects of financing constraints, managerial flexibility, and the value of the firm's real options on cash holdings. Results indicate that financially unconstrained companies and the companies with the valuable real options tend to have greater cash holdings. In addition, increase in cost of capital is an important factor that encourages the firms to hold more cash. Finally, companies with increased market power, and the companies with lower operational flexibility tend to hold less cash.

Al-Najjar (2013) has analyzed the data of Chinese, Brazilian, Indian and Russian firms, in particular, to explore the effects of dividend policy and capital structure on corporate cash holdings. The study observed that dividend policy and capital structure have some role in determining the corporate cash holdings. Notably, he observed that similar variables in developed and developing countries, for example, firm size, dividend policy, and capital structure affect the cash holdings. Finally, results indicate that firms in countries with weak shareholder protection tend to hold more cash. Wasiuzzaman (2014) has used the data for publically traded firms in Malaysia for the period 2000-2007 for studying determinants of cash holdings. Results indicate that growth opportunities, cash flows, debt levels, dividends and substitutes of liquid assets are important variables that are positively linked to cash holdings. In contrast, results indicate that board independence is inversely related to corporate cash holdings. Moreover, firm size, cash flow volatility and board size have no significant affect on cash holdings. Mun and Jang (2015) have used the data for restaurants operating in America to explore the effects of working capital on profitability. In addition, they have analyzed the effects of cash level on profitability and working capital. A U-shape relationship was found between working capital and profitability. Furthermore, results indicate that cash is an important factor that affects the level of working capital. They found that interactive effects exist among working capital, profitability and cash.

Wu, Yang, and Zhou (2017) have analyzed the data of 1,873 firms listed on Shanghai and Shenzhen

Stock Exchanges of China during 2000-2013. They observed that Chinese MNCs do not have cash holdings greater than those of domestic firms unless those multinational companies greatly rely on foreign sales. Moreover, the multinationals of non-state owned enterprises shows the insignificant differences in cash holdings for non multinationals. Furthermore, they observed that Chinese MNCs invested more but had lower profitability particularly in non-state owned enterprises sample. Finally, they found that the need of liquid cash for MNCs in China was different from companies in the United States. In sum, results of earlier empirical studies (in different countries of the world) on determinants of corporate cash holdings are mixed. Thus, mixed findings are an important reason that has evoked the need for this study.

3. Data description and methodology

3.1 Data description

The aim of this article is to explore the determinants of cash holdings of MNCs in Pakistan. To estimate the effects of explanatory (i.e. firm-specific) variables on cash holdings, the data was collected through annual reports of listed MNCs on PSX for the period 2006-2016. Data for shares' market price was taken from annual diaries of PSX (*formerly Karachi Stock Exchange*). Total 31 MNCs were found listed on PSX during the study period. Data of some companies was found missing during the study period; that is why, final sample consists of 260 observations relevant to 28 MNCs during 11 years.

3.2 Measurements of variables

Variables used in this study and their measurements are taken from previous empirical studies on corporate cash holdings. Variables' definitions are reported in Table 1.

Table 1: Variables' definitions

Variable		Definition
Cash	$CASH_{it}$	Cash & bank balance / Net assets. Net assets defined as taking the difference between total assets and cash & bank balance.
Profitability	PRO_{it}	Profit before taxes / Net assets.
Firm Size	$SIZE_{it}$	Natural logarithm of total sales.
Leverage	LEV_{it}	Total liabilities / Stockholders equity.
Growth	GRO_{it}	Market price per share / Book value per share. Market price per share determined as (high price of the year + low price of the year / 2)
Dividend Yield	DY_{it}	Dividend per share / Market price per share.
Cash Flow	$CFLO_{it}$	Profit from operations + depreciation + amortization / Net assets.
Working Capital	WC_{it}	Net current assets - Current liabilities / Net assets. Net current assets are computed by taking difference between current assets and cash & bank balance.
Capital Expenditures	CE_{it}	Long-term assets / Net assets.

3.3 Methodology

Congruent with earlier empirical studies three panel data techniques such as OLS, fixed effects method and random effects method were used to explore the effect of explanatory variables on cash holdings of MNCs. Further, Hausman test (1978) was used to select either the random effects method or the fixed effects method was preferable to predict the effect. The basic regressions are presented as follow:

$$CASH_{it} = \beta_0 + \beta_1 PRO_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GRO_{it} + \beta_5 DY_{it} + \beta_6 CFLO_{it} + \beta_7 WC_{it} + \beta_8 CE_{it} + \varepsilon_{it} \dots (OLS)$$

$$CASH_{it} = \beta_{0i} + \beta_1 PRO_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GRO_{it} + \beta_5 DY_{it} + \beta_6 CFLO_{it} + \beta_7 WC_{it} + \beta_8 CE_{it} + \mu_{it} \dots (FE)$$

$$CASH_{it} = \beta_0 + \beta_1 PRO_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GRO_{it} + \beta_5 DY_{it} + \beta_6 CFLO_{it} + \beta_7 WC_{it} + \beta_8 CE_{it} + \varepsilon_i + \mu_{it} \dots (RE)$$

4. Results

4.1 Descriptive statistics

Descriptive statistics presented in Table 2 indicates that cash & bank balance on average represents 12.17 percent of net assets. Net assets are defined as total assets minus cash & bank balance. Table 3 presents the yearly averages of cash & bank balance during the study period. Results indicate that cash & bank balance vary from 8 percent to 18.3 percent. The variation in cash & bank balance may be due to policy decisions made by the companies' management keeping in mind the needs of business during military (2006-2008) and political regimes (2009-2016). The mean of firm size, calculated as natural log of sales, is 16.06. The mean of leverage, measured as debt to equity ratio, is 260 percent. Mean value of market-to-book ratio (i.e. growth) is 5.51 times. The mean dividend yield is 2.85 percent. The mean cash flows are 22.24 percent of net assets. Mean working capital ratio is 10.12 percent of net assets, and finally capital expenditures represent 40.18 percent of net assets.

Table 2: Descriptive statistic

Variable	<i>N</i>	Mean	SD	MIN	MAX
$CASH_{it}$	260	0.1217	0.1956	0.0003	1.3843
PRO_{it}	260	0.1662	0.1630	-0.1444	0.7167
$SIZE_{it}$	260	16.067	1.3404	12.849	19.340
LEV_{it}	260	2.6075	1.5256	1.0020	10.892
GRO_{it}	260	5.5170	10.124	0.2553	106.35
DY_{it}	260	0.0285	0.0286	0.0000	0.1251
$CFLO_{it}$	260	0.2224	0.1643	-0.0539	0.8049
WC_{it}	260	0.1012	0.2552	-0.8115	0.6730
CE_{it}	260	0.4018	0.1959	0.0004	0.9993

Table 3: Yearly averages of cash & bank balance

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cash & bank Balance	10	13.9	8.4	9.1	12.3	8.0	9.1	8.5	10.4	18.3	13.8
No. of obs.	15	22	23	27	28	28	28	28	28	28	5

4.2 Regression Results

Regression results on the relation between firm-specific variables and cash holdings are reported in Table 4. Results indicate that in all regressions, profitability is significant (positive) predictor of cash holdings. In pooled OLS method, firm size is directly related to cash holdings. In contrast, size is negatively related to cash holdings in the random effects and fixed effects method; however the relationship found is not significant. In all estimation methods, leverage, growth, dividends, working capital ratio and capital expenditures are significant (negative) predictors of cash holdings. Finally, cash flows have no significant affect on cash holdings. The Hausman test results favor to use fixed effects method's estimates. In sum, regression results confirm that firm-specific variables significantly affect the cash holdings of MNCs.

Table 4: Effects of firm-specific variables on corporate cash holdings

Variables	Pooled OLS		Fixed Effects		Random Effects	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	z-Statistic
<i>C</i>	0.1547	1.32	0.7066***	3.08	0.4668***	2.69
<i>PRO_{it}</i>	0.7145***	2.69	0.7547***	3.16	0.8213***	3.35
<i>SIZE_{it}</i>	0.0213***	3.10	-0.0212	-1.54	-0.0027	-0.26
<i>LEV_{it}</i>	-0.0721***	-7.37	-0.0377***	-4.46	-0.0472***	-5.40
<i>GRO_{it}</i>	-0.0065***	-6.23	-0.0024**	-2.54	-0.0037***	-3.79
<i>DY_{it}</i>	-0.9162***	-3.02	-0.8235***	-3.07	-0.8825***	-3.21
<i>CFLO_{it}</i>	-0.0114	-0.04	-0.0429	-0.18	-0.1378	-0.57
<i>WC_{it}</i>	-0.6372***	-10.4	-0.7804***	-12.6	-0.7381***	-12.1
<i>CE_{it}</i>	-0.4410***	-7.90	-0.3636***	-4.02	-0.4091***	-5.42
<i>R</i> ²	0.6006		0.3605		0.4737	
F-Statistic	47.17		57.90			
Prob (F-Statistic)	0.0000		0.0000			
Wald χ^2					401.90	
Prob (Wald χ^2)					0.0000	
Hausman Test (χ^2)			95.42			
Prob. (χ^2)			0.0000			

5. Discussion on empirical results

The results of regression suggest that profitability positively affects cash holdings. This positive effect is consistent with the argument that highly profitable companies hold more cash for permanent as well as seasonal needs. Moreover, profitable firms prefer to use cash to pay dividends in order to mitigate the agency problems that stems from the availability of free cash flow. The positive relationship confirms the findings of Mun and Jang (2015), Al-Najjar (2013). Firm size also positively affects cash holdings. The positive effect of size on cash holdings confirms the fact that large firms have more ability to generate profits due to economies of scale which in turn make them able to accumulate cash that can be used to finance permanent as well as temporary needs. The positive effect supports the findings of study by Ozkan and Ozkan (2004). Moreover, leverage negatively affects cash holdings. This negative effect is congruent to the predictions of pecking order hypothesis which suggests that profitable companies with sufficient liquid resources (i.e. cash holdings) borrow less compared to profitable companies with insufficient liquid resources. The negative relationship between leverage and cash holdings found consistent to the findings of Mun and Jang (2015), Al-Najjar (2013), and Opler et al. (1999).

Notably, capital expenditures (i.e. investment in real assets) and growth opportunities (i.e. market-to-book ratio) are inversely related to cash holdings. Although the negative relationship seems illogical however this may be due to the reason that profitable MNCs despite the availability of cash avoid unnecessary/unproductive investment in real assets in order to mitigate the agency problems that stems from the availability of free cash flow. The inverse relationship between growth opportunities and cash holdings confirm the findings of Ferreira and Vilela (2004). Alternatively, the inverse relationship between capital expenditures and cash holdings confirms the findings of Wasiuzzaman (2014). Dividends are negatively associated with cash holdings. This negative association is in line with the fact that distribution of cash to shareholders leads to reduction in liquid resources. Thus firms that distribute cash dividend hold less cash. The inverse relationship between dividends and cash holdings confirms the findings of Al-Najjar (2013), Opler et al. (1999), and Ozkan and Ozkan (2004). Working capital ratio is

negatively related to cash holdings. Working capital ratio is measured by taking the difference between current assets except cash & bank balance and current liabilities scaled by net assets. The mean value of working capital ratio is positive which indicates that MNCs prefer to finance current assets with short-term as well as long-term funds. Moreover, it indicates that availability of sufficient liquid resources diminishes the need for cash due to the reason that net current assets can be convertible into cash as needed. The negative relationship confirms the findings of Mun and Jang (2015), Opler et al. (1999).

In synopsis, results indicate that profitability, size, leverage, growth, dividends, capital expenditures, and working capital ratio are some important variables that significantly affect the cash holdings. Moreover theories relevant to cash holdings i.e. pecking order theory, trade-off model of cash holdings, and free cash flow theory surely provide some support to explain the cash holding behavior of MNCs in Pakistan.

6. Conclusion

We have explored the effects of firm-specific variables on cash holdings of listed MNCs in Pakistan. Results reported in Table 3 indicate that the amount of cash & bank balance vary from 8 percent to 18.3 percent of net assets during the study period. The variation in cash holdings may be due to the policy decisions made by the managers because of uneven business condition during military (2006-2008) and political regimes (2009-2016). The results of regression presented in Table 4 indicate that profitability is positively associated to cash holdings. The positive impact of profitability on cash holdings is consistent with the argument that highly profitable companies hold more cash for permanent as well as seasonal needs. Moreover, they may use cash to pay dividends to shareholders in order to mitigate the agency problem that stems from the availability of free cash flow. It was also found that firm size positively effects cash holdings. This positive effect confirms the fact that large size companies possess greater ability for generating profits because of economies of scale which in turn make them able to accumulate cash that can be used to meet permanent as well as temporary needs. Leverage is inversely related to cash holdings. The inverse relationship confirm the predictions of pecking order theory that profitable companies having sufficient liquid resources (i.e. cash holdings) borrow less compared to less profitable companies having insufficient liquid resources. Capital expenditures and growth are negatively related to cash holdings. Although the negative relationship seems illogical however this may be due to the reason that profitable MNCs despite the availability of cash avoid unnecessary investment in real assets in order to mitigate the agency problem. Dividends are inversely related to corporate cash holdings. The inverse relationship is in support of the fact that cash distribution to shareholders leads to reduction in liquid resources. Thus, firms distributing cash dividends hold less cash. Working capital ratio is negatively related to cash holdings. More importantly, the mean value of working capital is positive which indicates that MNCs prefer to finance current assets with short-term as well as long-term funds. Moreover, it indicates that availability of sufficient liquid resources diminishes the need for holding excess cash.

In short, the findings suggest that company profitability, size, leverage, growth opportunities, dividends, capital expenditures, and working capital ratio are some crucial variables which substantially impact the cash holdings of MNCs in Pakistan. The results of this research provide guidance to corporate managers in determining a balanced amount of cash, keeping in mind the positive or negative effects of explanatory variables. This study has explored the effects of firm-specific variables on corporate cash holdings however there is a need to explore the effects of governance variables on cash holdings of MNCs in Pakistan which is the task for future research.

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